

What is claimed is:

1. An adaptive filter to suppress repetitive  
2 high-frequency information in an image comprising  
3 pixels, the image having repetitive high-frequency  
4 information, comprising:  
5 decision circuitry to identify the repetitive  
6 high-frequency information in at least a subset of the  
7 pixels of the image to provide a repetitive-sequence  
8 signal;  
9 a low-pass filter to filter the image to produce  
10 low-pass filtered pixels; and  
11 a switch to output the pixels of the image as  
12 adaptive-filter output, and in response to the  
13 repetitive-sequence signal, to output the low-pass  
14 filtered pixels as the adaptive-filter output.

1. The adaptive filter of claim 1 wherein the  
2 low-pass filter filters the pixels of the image by  
3 averaging a predetermined number of pixels.

1. The adaptive filter of claim 1 wherein the  
2 decision circuitry disables the repetitive-sequence  
3 signal at the beginning of a scan line.

1. The adaptive filter of claim 1 wherein a  
2 transition has a sign, and a transition is indicated  
3 when a difference in luminance between two pixels  
4 exceeds a predetermined transition value and that  
5 difference has a sign that is different from the sign  
6 of a previous transition value, and the decision  
7 circuitry identifies a repetitive sequence when at

8       least a predetermined number transitions occur in a  
9       sequence of pixels having a predetermined number of  
10      pixels.

1       5.   The adaptive filter of claim 1, wherein a  
2       transition has a sign, and a transition is indicated  
3       when a difference in luminance between two adjacent  
4       pixels exceeds a predetermined transition value and a  
5       sign of that difference is different from the sign of a  
6       previous transition value, and a sequence of pixels is  
7       associated with a respective sequence of transitions,  
8       the sequence of transitions having a predetermined  
9       number of zones, and the decision circuitry activates  
10      the repetitive-sequence signal when each zone has one  
11      or more transitions.

1       6.   The adaptive filter of claim 5 wherein the  
2       decision circuitry deactivates the repetitive-sequence  
3       signal when one or more zones have no transitions.

1       7.   The adaptive filter of claim 1 wherein the image  
2       is a video image.

1       8.   A video transmitter system comprising:  
2                an adaptive filter to suppress at least a  
3       portion of repetitive high-frequency information from a  
4       video signal to provide an adaptive-filter video  
5       signal;  
6                a compression engine to compress the  
7       adaptive-filter video signal to provide a compressed  
8       video signal; and

9                   a network interface to transmit the  
10                compressed video signal over a transmission medium.

1       9.   The video transmitter system of claim 8 wherein  
2        the adaptive filter comprises:

3                decision circuitry to identify the repetitive  
4                high-frequency information in the video signal to  
5                provide a repetitive-sequence signal;

6                a low-pass filter to filter the video signal to  
7                produce a low-pass filtered video signal; and

8                a switch to output the video signal as the  
9                adaptive filter video signal, and in response to the  
10               repetitive-sequence signal, to output the low-pass  
11               filtered video signal as the adaptive-filter video  
12               signal.

1       10.   The video transmitter system of claim 9 wherein  
2        the video signal is a digital video signal comprising  
3               pixel values, and the low-pass filter filters the  
4               digital video signal by averaging a first predetermined  
5               number of pixel values.

1       11.   The video transmitter system of claim 9 wherein  
2        the decision circuitry is reset to disable the  
3               repetitive-sequence signal at the beginning of each  
4               scan line.

1       12.   The video transmitter system of claim 9 wherein a  
2        transition has a sign, and the decision circuitry  
3               indicates a transition when a difference in luminance  
4               between two pixels exceeds a predetermined transition  
5               value and the sign of that difference is different from

6 the sign of a previous transition, and activates the  
7 repetitive-sequence signal when at least a  
8 predetermined number of transitions occur in a sequence  
9 of pixels having a predetermined number of pixels.

1 13. A method for suppressing repetitive high-frequency  
2 information in a video image having repetitive  
3 high-frequency information, the video image having  
4 pixels represented as video image data, comprising:

5 identifying repetitive high-frequency  
6 information in the video image data;  
7 low-pass filtering the video image data to  
8 produce low-pass filtered video image data; and  
9 when the repetitive high-frequency  
10 information is identified, outputting the low-pass  
11 filtered video image data as adaptive-filter image  
12 data, otherwise outputting the unmodified video image  
13 data as the adaptive-filter image data.

1 14. The method of claim 13 wherein the video image  
2 data comprises grayscale values; and wherein said  
3 low-pass filtering averages a subset of the grayscale  
4 values to produce at least a subset of the adaptive  
5 filter image data.

1 15. The method of claim 13 wherein the video image  
2 data is color video data having an luminance component  
3 and a color component; and wherein said low-pass  
4 filtering modifies a subset of luminance components to  
5 produce at least a subset of the adaptive-filter image  
data.

1       16. The method of claim 13 wherein said identifying  
2       identifies repetitive high-frequency information in the  
3       video image when a difference in luminance between two  
4       pixels is greater than or equal to a predetermined  
5       threshold for a predetermined number of pixels.

1       17. The method of claim 13 wherein said identifying  
2       identifies non-repetitive information, and further  
3       comprising:

4               passing the video image data when repetitive  
5       high-frequency information is not identified.

1       18. The method of claim 13 wherein a transition has a  
2       sign and said identifying identifies a transition when  
3       a difference in luminance between two pixels exceeds a  
4       predetermined transition value and the sign of that  
5       difference is different from the sign of a previous  
6       transition, and identifies a repetitive sequence when  
7       at least a predetermined number transitions occur in a  
8       sequence of pixels having a predetermined number of  
9       pixels.

1       19. The method of claim 13 wherein a transition has a  
2       sign, and said identifying identifies a transition a  
3       difference in luminance between two adjacent pixels  
4       exceeds a predetermined transition value and a sign of  
5       that difference is different from a sign of a previous  
6       transition, and a sequence of pixels is associated with  
7       a respective sequence of transitions, the sequence of  
8       transitions having a predetermined number of zones, and  
9       said identifying identifies the high-frequency

10 repetitive information when each zone has one or more  
11 transitions.

1 20. The method of claim 19 wherein said identifying  
2 does not identify repetitive high-frequency information  
3 when one or more zones have no transitions.

1 21. An adaptive filter to suppress repetitive  
2 high-frequency information in an image comprising  
3 pixels, the image having repetitive high-frequency  
4 information, comprising:

5 means for identifying the repetitive  
6 high-frequency information in at least a subset of the  
7 pixels of the image to provide a repetitive-sequence  
8 signal;

9 means for filtering the image to produce  
10 low-pass filtered pixels; and

11 means for outputting the pixels of the image  
12 as adaptive-filter output, and in response to the  
13 repetitive-sequence signal, outputting the low-pass  
14 filtered pixels as the adaptive-filter output.

1 22. The adaptive filter of claim 21 wherein the means  
2 for filtering filters the pixels of the image by  
3 averaging a predetermined number of pixels.

1 23. The adaptive filter of claim 21 wherein the means  
2 for identifying disables the repetitive-sequence signal  
3 at the beginning of a scan line.

1 24. The adaptive filter of claim 21 wherein a  
2 transition has a sign, and the means for identifying

3 indicates a transition when a difference in luminance  
4 between two pixels exceeds a predetermined transition  
5 value and a sign of that difference is different from a  
6 sign of a previous transition, and the means for  
7 identifying identifies a repetitive sequence when at  
8 least a predetermined number transitions occur in a  
9 sequence of pixels having a predetermined number of  
10 pixels.

1 25. The adaptive filter of claim 21, wherein a  
2 transition has a sign, and the means for identifying  
3 indicates a transition when a difference in luminance  
4 between two adjacent pixels exceeds a predetermined  
5 transition value and a sign of that difference is  
6 different from a sign of a previous transition, and a  
7 sequence of pixels is associated with a respective  
8 sequence of transitions, the sequence of transitions  
9 having a predetermined number of zones, and the  
10 decision circuitry activates the repetitive-sequence  
11 signal when each zone has one or more transitions.

1 26. The adaptive filter of claim 25 wherein the means  
2 for identifying deactivates the repetitive-sequence  
3 signal when one or more zones have no transitions.

1 27. The adaptive filter of claim 21 wherein the image  
2 is a video image.